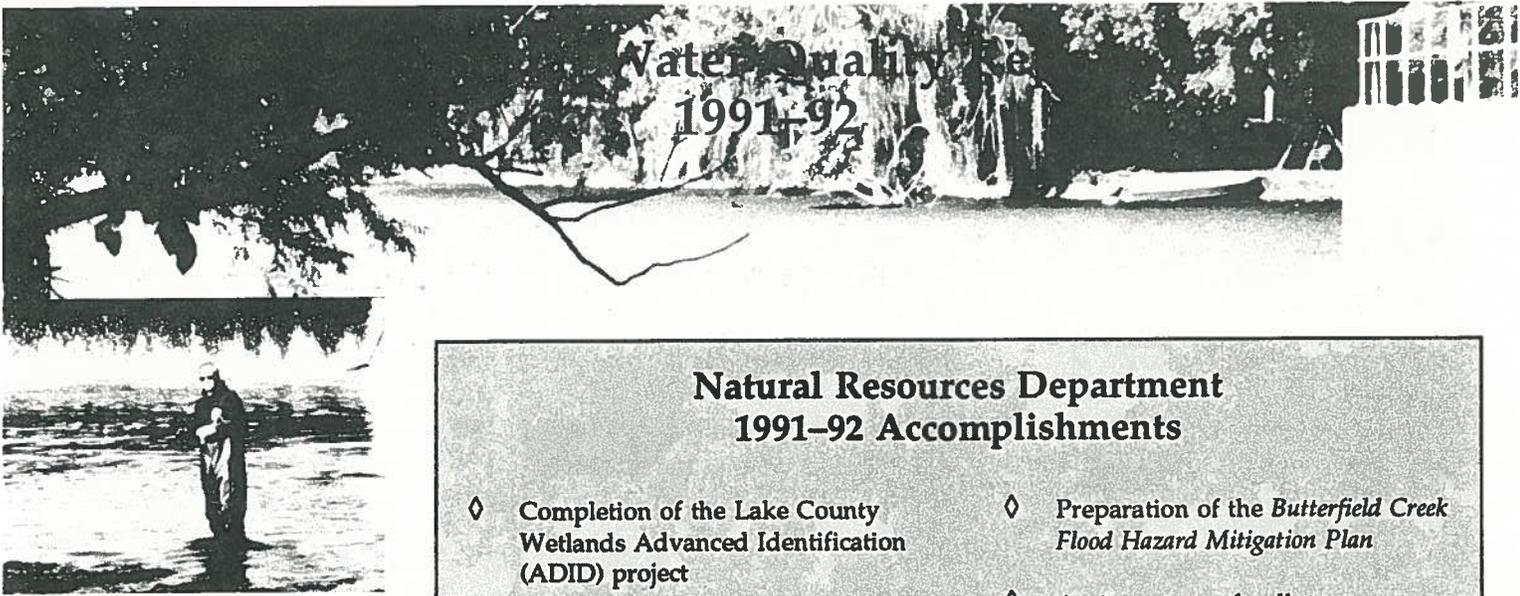


# Water Quality Report 1991-92



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## Natural Resources Department 1991-92 Accomplishments

- ◇ Completion of the Lake County Wetlands Advanced Identification (ADID) project
- ◇ Continued assistance as Technical Director to the Special Area Management Plan (SAMP) for the Chain O'Lakes-Fox River
- ◇ Preparation of the *Best Management Practice Guidebook for Urban Development*
- ◇ Preparation of a report, *Investigation of Hydrologic Design Methods for Urban Development in Northeastern Illinois*
- ◇ Preparation of *A Guide to Illinois Lake Management*
- ◇ Evaluation of the water quality effects of the DuPage County Stream Maintenance Program
- ◇ Phase I Clean Lakes Program diagnostic/feasibility studies completed for McCullom Lake (McHenry Co.) and Herrick Lake (DuPage Co.)
- ◇ Lake restoration and ecological enhancement programs continued at the Skokie Lagoons (Cook Co.)
- ◇ Preparation of a report, *Demonstration of an Urban Nonpoint Source Planning Methodology for Butterfield Creek*
- ◇ Preparation of a report, *Application of Urban Targeting and BMP Selection Methodology to Butterfield Creek, Cook & Will Counties, Illinois*
- ◇ Preparation of the *Butterfield Creek Flood Hazard Mitigation Plan*
- ◇ An inventory of pollutant sources in Illinois' portion of the Lake Michigan watershed completed as part of the Lakewide Management Plan (LaMP) for Lake Michigan
- ◇ Coordination of the 1991-92 Volunteer Lake Monitoring Program for 44 lakes in northeastern Illinois
- ◇ Coordination of "A National Monitoring and Evaluation Conference and Nonpoint Source Workshop" for U.S. EPA
- ◇ Coordination of a fifth national conference for U.S. EPA entitled "Enhancing the States' Lake Management Programs—Strengthening State and Local Interactions"
- ◇ Continued technical support of countywide and watershed stormwater management planning programs
- ◇ Review of 27 Level II Illinois Water Quality Management Plan amendment requests including 19 FPA boundary changes, 3 plant expansions, 3 applications for new discharges, and 2 land treatment systems. Also reviewed 104 requests for reissues, modification or termination of NPDES permits

# Twenty Years After the Clean Water Act . . . Where Do We Stand?

**O**n October 18, 1972, Congress enacted the Clean Water Act. Its goals were laudable and ambitious. They included the elimination of pollutant discharges into navigable waters by 1985, the protection and propagation of fish and wildlife and the provision for recreation in and on the water by 1983. The Act also instituted policies to prohibit "the discharge of toxic pollutants in toxic amounts," to provide federal financial assistance to construct public waste treatment works, to develop areawide planning programs to assure adequate control of all sources of pollutants, and to develop and implement programs for the control of nonpoint sources of pollution.

*The Good News:* A comprehensive Areawide Water Quality Management Plan (AWQMP) was completed by NIPC in 1979 and was subsequently incorporated into the Illinois Water Quality Management Plan. The AWQMP identified an array of controls for point sources (e.g., wastewater treatment plants) and nonpoint sources (e.g., urban and agricultural runoff) which would be necessary to meet applicable water quality standards.

With the assistance of federal funds, most of the point source controls have been implemented. Some notable examples include the construction of much of the Tunnel and Reservoir Plan (TARP) by the Metropolitan Water Reclamation District of Greater Chicago and the upgrading of numerous wastewater treatment plants from primary and secondary levels of treatment to tertiary levels. As a result, discharges of oxygen-demanding organic material, ammonia, and other pollutants have been substantially reduced. Correspondingly, while State standards are still violated for certain constituents, water quality has improved dramatically in some

of our more degraded waterbodies, including the Chicago, Des Plaines, and Fox rivers. Biological indicators have improved in many waterbodies as well.

Other successes include improved standards for control of nonpoint source impacts from urban development. Within the last several years, NIPC has developed or updated ordinances for stormwater drainage and detention, soil erosion and sediment control, floodplain management, and stream and wetland protection. There has been growing acceptance by local governments of comprehensive ordinance requirements including provisions which address water quality. In the last year, comprehensive stormwater ordinances have been adopted by the countywide stormwater management committees in DuPage and Lake counties and by a number of communities in the Butterfield Creek watershed in southern Cook County.

*The Bad News:* With few exceptions, and despite the improvements noted above, the streams, rivers, and lakes in urban and suburban northeastern Illinois are not meeting the goals of the Clean Water Act to provide for "fishable and swimmable" conditions. When evaluated by the Illinois Environmental Protection Agency (IEPA), virtually all of the streams with predominantly urban watersheds fell into the lowest two categories (out of four) based on a statewide rating system which measures achievement of aquatic life uses. In contrast, nearly all of the rural streams in the region were rated in the two highest categories. For example, in the mostly developed Des Plaines River/Lake Michigan Basin, over 57 percent of the stream miles exhibited moderate to severe use impairment for aquatic life.

IEPA has concluded that both point and nonpoint sources contribute to identified use impairments. As stated above, point source discharges have been dramatically improved, but residual problems remain. For example, some treatment plants continue to discharge chlorine in their effluents which can be toxic to sensitive aquatic life, though recently enacted water quality standards for chlorine should eliminate this problem in the near future. Other problems are related to the bypass of untreated or partially treated wastewater due to the overloading of leaky sanitary sewers with stormwater during large storms. In addition, most point sources continue to discharge high concentrations of nutrients which can result in excess growth of algae and aquatic plants, especially in impoundments and slow-moving streams.

The primary identified nonpoint sources are urban runoff, construction site erosion, and stream channel modification. Nonpoint source impacts are pervasive throughout our urban watersheds, and many of the problems identified in the AWQMP remain problems today.

There are several reasons why urban nonpoint source problems have been difficult to remediate, as evidenced in the findings of a recently completed nonpoint source assessment of Butterfield Creek in south Cook County. First, unlike the control of point source discharges, the control of most nonpoint sources is voluntary. For example, there have been no explicit requirements that local governments or land owners remediate problems related to degraded urban runoff. Second, remediation of nonpoint problems can be very expensive and there are presently no outside funding sources, similar to the wastewater construction grants program of the 1970s and 1980s, to aid local enti-

ties. Third, as an individual issue, water quality improvement typically is not viewed as a high priority by local and state elected officials who must approve remedial programs and funds. It appears, however, that support for water quality measures can be improved if they are coordinated with efforts to address more "critical" issues like flooding.

Another concern is the adverse impact of new development on high quality waterbodies, particularly in Kane, McHenry, and Will counties. NIPC's newly adopted *Strategic Plan for Land Resource Management* noted that massive urban sprawl has occurred in our region during the last 20 years, despite a very stable population base. There is concern that, despite improved information and guidance regarding nonpoint source best management practices (BMPs), ongoing suburbanization is causing substantial degradation of water resources. This fear is based largely on field observations of construction activities which indicate that many current development

practices are little different than they were 10 to 20 years ago with respect to their control of nonpoint source impacts. For example, as documented in last year's Water Quality Report, despite the fact that most local governments in the region have adopted ordinances for erosion and sediment control for construction activities, few adequately enforce their requirements.

### NIPC Nonpoint Source Control Activities

NIPC's response to the problems identified above has been to emphasize the critical importance of public education and technical assistance in the area of nonpoint source control. With the support of IEPA, NIPC has utilized funds from the U.S. Environmental Protection Agency (U.S. EPA) to develop a number of important technical assistance materials. Recently, a guidebook has been completed to identify best management practices (BMPs) to minimize the critical impacts of urban development.

NIPC also is preparing a more technical course curriculum addressing the design and implementation of stormwater runoff BMPs, including swale drainage, vegetated filter strips, infiltration trenches and basins, and detention basins. Finally, NIPC is working with the assistance of local soil and water conservation districts and county stormwater committees in the production of an educational video on effective soil erosion and sediment control practices for construction sites. These latter two products will be completed in the fall and winter of 1992.

NIPC also worked with IEPA to require the formal consideration of nonpoint source impacts in the review of applications for wastewater service area expansions or revisions. Specifically, all applicants for facility planning area (FPA) amendments must have ordinances with nonpoint control standards for stormwater runoff, erosion and sediment control, and stream and wetland protection. ♠

## Commentary

### Water Quality Needs and Opportunities

As reported in last year's Water Quality Report, new federal permitting requirements for stormwater discharges from industrial sources become effective on October 1, 1992. Of particular note relative to the problems described above, all construction activities involving land disturbances of five or more acres will be required to obtain a permit from IEPA. Permit issuance will require the submittal of site design plans which identify BMPs to control runoff pollutants both during and after construction operations. IEPA has drafted a general permit identifying required control measures and submittal procedures. While this program has been somewhat controversial—regarding its requirements for potentially expensive stormwater monitoring and permit application procedures—it offers a real opportunity to achieve more consistent and

effective control of urban nonpoint source impacts.

Critical to the assessment of water quality achievements—and problems—is adequate data. Unfortunately, budget constraints generally limit water quality data collection to a few stations on larger rivers and streams which are sampled no more frequently than once per month. This information makes it difficult to track local trends or to quantify nonpoint source impacts. One of the important immediate needs is to collect representative data from urban streams to assess improvements related to remedial nonpoint source control efforts. Another need is to track water quality trends in rapidly developing watersheds to determine whether BMPs are being effectively implemented and whether water quality and beneficial uses are being protected.

Finally, it may be an appropriate time, 20 years after the enactment of the Clean Water Act, for formal reevaluation of the status of northeastern Illinois' water quality problems and achievements. It was initially envisioned that plan assessment and implementation activities would be facilitated by the continuation of technical and policy review mechanisms established in the AWQMP process, such as watershed and technical advisory committees. This has not transpired, however, because of limited available funding for water quality planning activities and a prioritization of planning programs which has not recognized the need for such public review mechanisms. NIPC will revisit these needs and opportunities in the coming year.

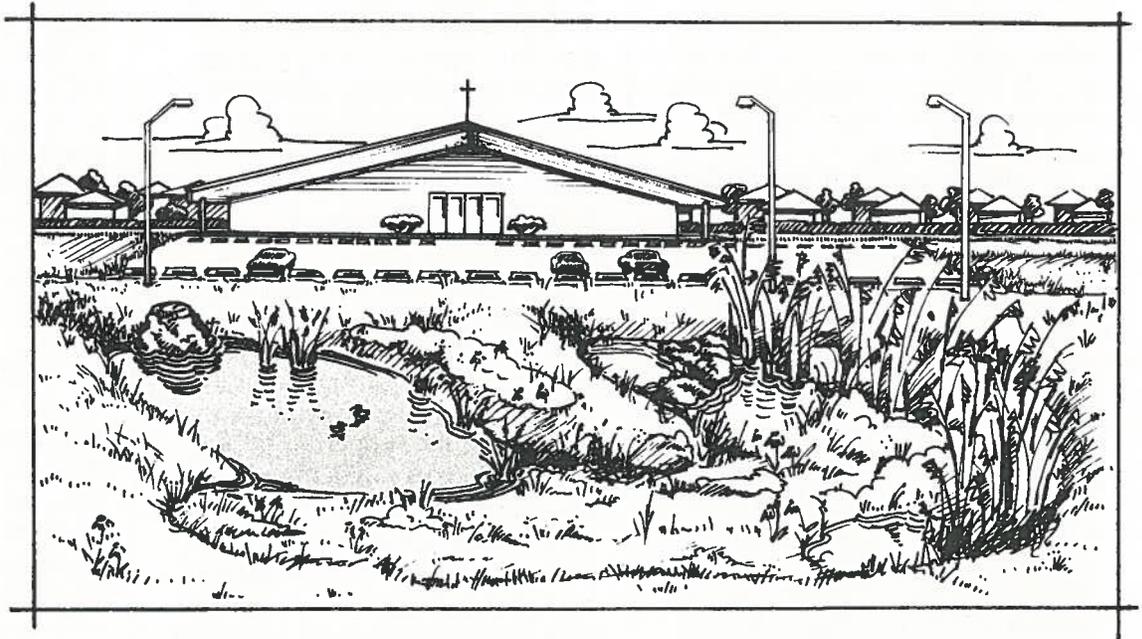
# Demonstration of Innovative Stormwater Detention Design

**W**ater quality and aquatic life in Butterfield Creek in Cook County, as well as in many other streams in northeastern Illinois, have been shown to be impacted by urban nonpoint source pollution. Stream sediments are contaminated with heavy metals and organic constituents contributed by urban runoff. To address this problem, as well as flooding problems, most of the communities in the Butterfield Creek

watershed have adopted a comprehensive stormwater management ordinance. This ordinance addresses drainage and detention design, soil erosion and sediment control, and floodplain management.

The requirements of the Butterfield Creek stormwater ordinance are more stringent than typically encountered by most developers in northeastern Illinois. To illustrate development under these more stringent requirements, a demonstration project was needed to show that the release rates and runoff pollutant control measures specified in the ordinance are implementable and that developments designed according to the ordinance will have much less adverse impacts on downstream water quantity and quality. The demonstration project was funded by the U.S. EPA.

The demonstration site is part of an existing development that is being expanded. The development was chosen by NIPC after the site was identified as a candidate by members of the Butterfield Creek Steering Committee. The site is a



church in Homewood whose parking lot is being expanded into an area presently occupied by a detention basin. This necessitated construction of a new detention basin to serve both the existing development and the new parking area. In this demonstration project, the church and its engineer worked with NIPC to design and construct the drainage and detention portion of the development to meet the requirements of the Butterfield Creek ordinance.

The new drainage and detention plan features swale drainage for the parking lot and an extended detention basin. The runoff from the parking lot will first discharge into the swale—increasing infiltration opportunities and filtering and settling of pollutants—and then into the detention basin. The detention basin will control virtually all sizes of storm events to specified release rates through a dual outlet structure that controls the 2- and 100-year events. Because the low release rates will cause wet conditions in the bottom of the basin, the bottom is being vegetated with wetland

plants. This also will improve sediment and pollutant filtering.

It is expected that over 90 percent of the total suspended solids (TSS) and 50 percent of the total phosphorous and copper will be removed by the swale and detention basin system. This is in contrast to a standard storm sewered development with a dry bottom detention basin where less than 40 percent TSS and less than 10 percent phosphorous and copper removal would be expected.

Construction of the demonstration is scheduled to be complete by the fall of 1992 and a report will be available shortly thereafter. As part of the documentation of these drainage and detention features, video footage will be taken. ♦

# Retrofitting Detention Basins to Improve Water Quality

Most existing detention basins were designed solely for the purpose of controlling flooding, typically for the 100-year event. However, with some modification, these detention basins can be retrofitted to remove runoff pollutants and to stabilize runoff rates which cause channel erosion. Effective modifications to existing detention basins include stilling basin installation, outlet structure modification, short circuiting prevention, bottom regrading, and vegetation replacement.

Because of the potential value of detention basin retrofitting in remediating identified water quality problems in the Butterfield Creek watershed in Cook County, detention retrofitting was chosen as the subject of a demonstration project. This project is funded partially by

the U.S. EPA, through the IEPA, under Section 319 of the Clean Water Act. The project is funded also by the Villages of Flossmoor and Matteson, and NIPC. Under this project, two existing detention basins in the Butterfield Creek watershed will be modified.

Both of the selected detention basins are in need of rehabilitation and maintenance due to sedimentation, erosion, and growth of undesirable vegetation. In one of the basins, the overflow structure has completely washed out.

Both of the retrofit sites are dry detention basins that ordinarily provide little water quality benefits. To improve the water quality functions of these basins, many of the

detention features being used in NIPC's drainage and detention demonstration (see article page 4) will be retrofitted into these two basins. Pollutant removal rates should be similar to or slightly less than expected in the previously referenced demonstration. The total suspended solids removal efficiency for the retrofit basins is expected to be in the 70-90 percent range.

Construction of the retrofit modifications is scheduled for the summer of 1992 and a report will be released in the fall of 1993. As part of the documentation of the retrofit, a design brochure will be prepared and video footage will be available to others interested in detention retrofitting. ♦



## High Quality Wetlands in Lake County Receive Advanced Identification (ADID)

NIPC staff, with funding from the U.S. EPA, worked with federal, state, and local agencies in Lake County in a multi-year study to develop and implement a methodology to identify wetlands of exceptional functional value. The selected evaluation methodology considered the ecological, hydrological, and water quality functions provided by individual wetlands. Specific evaluation factors included wildlife habitat, presence of high quality plant communities or threatened wildlife species, stormwater storage, stream-bank and shoreline stabilization, sediment/toxicant retention, and nutrient removal and transformation.

The primary purpose of an ADID study is to assure adequate protection of exceptional quality wetlands. Also, with advance information regarding wetland quality, land owners and developers are better prepared to avoid disturbing sensitive wetland sites. Formal recognition of the significance of an ADID exceptional value determination was provided by the U.S. Army Corps of Engineers (Corps) and the U.S. EPA in a public notice released on April 20, 1992. The Corps indicated its intent to exert discretionary authority to override certain nationwide permits for activities in ADID wetlands. The U.S. EPA indicated that it considers ADID

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exceptional quality wetlands as generally unsuitable for filling for site development and that it would object to the issuance of permits to fill ADID wetlands.

The results of the ADID study received substantial comment at a public meeting held by the Corps and U.S. EPA. The clear majority of those speaking supported the intent of ADID to provide additional pro-

tection for high quality wetlands. However, many were concerned that only 198 out of over 8000 wetland sites in Lake County were identified as ADID wetlands. (It is notable, however, that the 198 ADID sites represent nearly 40 percent of the total wetland acreage in the county.) Several speakers expressed concern regarding the constraints that an ADID designa-

tion could place on certain public works projects, particularly new and expanded highways.

As of the publication date of this report, public comments on the ADID results were being reviewed and summarized by U.S. EPA. The Lake County ADID project is expected to be finalized in the summer of 1992. A similar ADID study of DuPage County also is nearing completion. ♦

## Chain O'Lakes-Fox River Special Area Management Plan (SAMP)

There exists in the far northwestern corner of the metropolitan area an extraordinary area of interconnected waterways called the Fox River Chain O'Lakes. In a low-lying area of marshes and glacial lakes, man has placed dams on the Fox River, creating meandered lakes and has dug channels to interconnect many of these lakes. The

result is several hundred miles of shoreline and boating waters that have provided recreational pleasure for several generations of boaters, fishermen, and naturalists.

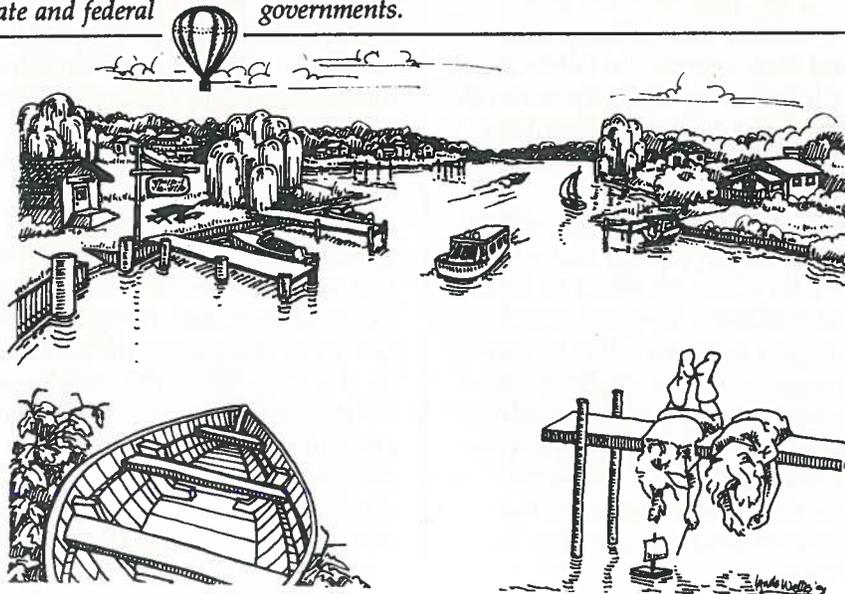
This unusual area has experienced the benefits and the problems that come from being near a major metropolitan area. In the late nineteenth and early twentieth

century, the Chain O'Lakes area was a recreational magnet, drawing vacationers by rail to enjoy the hotels and resorts in the area. As the auto age arrived, the area became a focal point for weekend and seasonal cottages. In the past twenty years, the area has increasingly become a year 'round home for people who travel to work throughout the urban area.

These waves of development have stressed the natural environment: construction practices, boating traffic, waste disposal methods—all have adversely affected the natural condition of the waterway. Indeed, nature itself tends to change areas of this sort, with shallow lakes tending to fill in over time and shorelines shifting in response to the ebb and flow of water. To maintain the delicate balance between man and nature, several major studies have been undertaken to define the appropriate public actions that would protect water quality, assure channels of adequate depth for boating, and to protect against flooding.

A recurring theme of previous studies has been the dispersed authority for managing this complex area. Several state and federal agencies, two counties, a dozen municipalities, and numerous special districts have specified roles

*The SAMP represented an unusual assemblage of citizen volunteers, technical experts, and regulatory authorities—united by a common interest to work together on programs for the betterment of the waterway. The participants have agreed to carry back to their governing boards a proposal to continue the dialogue, though on a less-formalized basis. It is hoped that the recommendations developed through the SAMP process will set in motion an ongoing campaign to protect the waterway—a campaign involving all governments along the waters and the many agencies of the state and federal governments.*



and responsibilities. The desire to bring these various legal authorities together in a coordinated attack on continuing problems led to the formation of the Chain O'Lakes Fox River Special Area Management Plan (SAMP) in late 1989.

Taking the lead in forming the SAMP was the U.S. Army Corps of Engineers. The Corps plays two important functions in the area: regulating construction in the water and regulating the filling of wet-

lands that abound near the water. The Chicago District Office of the Corps turned to a planning process used elsewhere in the country to meet unusual regulatory problems—the "special area management plan." Discussions about the process with state and local governments made it evident that the format of the SAMP would allow for the addressing of many interrelated problems. An Intergovernmental Agreement was

signed on January 8, 1990, setting forth the objectives "...to provide for protection of valuable environmental resources, to provide for safer boating/recreational uses and to provide for the comprehensive planning of future land uses in the waterway area...".

The Agreement was signed by representatives of McHenry County, Lake County, the Chain O'Lakes Fox River Waterway Management Agency, the Chicago District of the

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## SAMP Recommendations

### Water Quality

- Restoration alternatives, which may include aeration and/or bottom sediment nutrient inactivation, should be pursued for the northern, deeper lakes in the Chain O'Lakes.
- Water quality monitoring among the various entities currently collecting data should be coordinated.
- The U.S. Army Corps of Engineers' Environmental Impact Statement will include a detailed study of the impacts which watercraft operation may have on water quality and aquatic habitat in the SAMP area; this investigation should be supplemented whenever possible by others conducting monitoring or research activities within the waterway.
- Technical assistance and education programs available from agencies and public interest organizations should be targeted towards municipalities and residents within the watershed.
- Agencies and interested citizens are encouraged to assist the Lake County Soil and Water Conservation District in its conduct of the Sequoit Creek Watershed Management Project.
- Routine coordination should be established with governmental groups responsible for erosion control and protection of the Fox River in upstream Wisconsin.

### Wetlands

- The Corps and the Waterway Management Agency should resume their efforts to examine the technical alternatives for

maintaining adequate navigational depths in the waterway, drawing upon the expertise of other agencies.

### Flooding and Water Level Stabilization

- The gauging and telemetry network for predicting flood conditions should be enhanced.
- The State should conduct an environmental impact study to determine the impacts of winter draw-downs in the Chain O'Lakes on fish, wildlife, recreation, water quality, and physical structures.
- The state's Division of Water Resources should assess utilizing the storage capacity of the Chain O'Lakes during normal summer flows to buffer water level fluctuations experience in downstream reaches of the Fox River.
- Technical review and additional studies should be conducted to further investigate flood control alternatives for the Fox River and the Chain O'Lakes.

### Boating Safety

- Enact tougher penalties for operating under the influence.
- Require boater education and a mandatory boating safety certification for all engine-powered boat operators.
- Cause tougher enforcement of laws relating to night speed limits, no-wake zones, and navigation lighting on boats.
- Discourage oversized speed boats.
- Expand the requirements for use of personal flotation devices

- Enact special regulation of personal watercraft, such as jet skis.
- Consider quantity controls on the SAMP waters, after the completion of the current Environmental Impact Study.
- Identify additional financial resources for boating safety enforcement.

### Noise Control

- Local and state enforcement officials should obtain equipment and establish appropriate procedures for testing and enforcing motorboat noise levels.

### Cumulative Boating Impacts

- High visibility should be given to the draft Environmental Impact Statement (EIS) findings so that there will be full public review and comment on alternatives and their consequences.

### Shoreline Regulation

- The Illinois DOT and the Corps should continue a dialogue with the counties and municipalities in the SAMP area to reach agreement on guidelines for shoreline development and a cooperative regulatory process.
- The Illinois DOT and the Corps should consider incorporating the SAMP's agreed-upon guidelines for shoreline development into their respective rules for permitting in the SAMP area.
- The counties and municipalities in the SAMP area should consider incorporating SAMP's model ordinance for shoreline regulation into their local ordinances.

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U.S. Army Corps of Engineers and the Division of Water Resources of the Illinois Department of Transportation. The Agreement created a Steering Committee among the signatories.

In an effort to involve interested citizens as well as experts in a wide array of subjects, two subcommittees were formed: an Environmental Subcommittee and a Land Use/Recreation Subcommittee. The subcommittees were chaired by Steering Committee members but membership was left open to volunteers. As various subjects were

considered, specialized work groups were organized for more intensive investigations. The result was participation of more than 60 persons representing environmental specialists, law enforcement officials, planning departments, building and zoning officials, marina interests and shoreline residents. Likewise, among the governmental agencies, the active participation by federal, state, county and municipal representatives has been widely acknowledged as being extraordinary.

To coordinate the contributions of the many participants, the Steering Committee retained staff of

NIPC to serve as SAMP's technical director, and later as its secretary as well.

During the SAMP's two-year tenure, a wide range of issues facing the waterway were examined. When SAMP concluded in February 1992, a Master Plan was prepared which summarized the group's findings. The table above (see page 7) presents a grouping of the major issues discussed and a summary of the SAMP's recommendations. Integral to many of these were discussions about the current—and potential—extent of local, state, or federal regulatory authority. ♦

## Lake Michigan is Better Protected through *RAP* and *LaMP*

For many visitors and residents of northeastern Illinois, Lake Michigan provides an outstanding recreational resource. Lake Michigan is also valuable for drinking water, transportation, industry, and fish and wildlife habitat. As part of a regionwide initiative to address Great Lakes use impairments, NIPC has been assisting the IEPA and the U.S. EPA with the development of a Remedial Action Plan (RAP) and Lakewide Management Plan (LaMP) for Illinois' portion of Lake Michigan. The Great Lakes Water Quality Agreement (GLWQA) between the United States and Canada requires that state and provincial governments designate geographic Areas of Concern (AOC) on the Great Lakes where conditions have caused or are likely to cause the impairment of beneficial uses.

The Agreement further requires that Remedial Action Plans be prepared for each Area of Concern, and that they be submitted for broad public review. The International Joint Commission, the U.S. EPA, and the IEPA designated Waukegan Harbor in Lake County as an Area of Concern in 1981. This designation was prompted by the

discovery of high PCB concentrations in the harbor's sediments.

The Remedial Action Plan process, being carried out by a consulting engineering firm, consists of three stages. In Stage 1, the sources of contamination to the Area of Concern are identified and impairments to the Lake Michigan ecosystem are defined. The impaired uses identified to date are: restrictions on fish consumption, degradation of benthos (bottom-dwelling organisms), restrictions on dredging activities, beach closings, degradation of phytoplankton and zooplankton populations (microscopic plants and animals), and loss of fish and wildlife habitat.

During a RAP's Stage 2, remedial and regulatory measures are identified for "cleaning up" the Area of Concern. After the sites have been cleaned, monitoring to assess any lingering environmental degradation—RAP's Stage 3—is conducted.

Currently, the RAP process for the Waukegan Area of Concern is nearing the end of Stage 1. Contamination sources and use impairments in the Area of Concern are under review by the Waukegan

Harbor Citizens Advisory Group. The group represents business, civic, educational, environmental, governmental, industrial, and recreational interests in the Waukegan area. Full public review of the Stage 1 material is expected to commence in the summer of 1992.

The Great Lakes Water Quality Agreement also calls for the development of a Lakewide Management Plan (LaMP) for critical pollutants within each of the Great Lakes. The purpose of a LaMP is to reduce loadings of critical pollutants in order to restore the beneficial uses of the lake's open waters. NIPC is assisting IEPA to identify the locations and types of potential sources of toxic materials and nutrients that originate within Illinois' portion of the Lake Michigan watershed. The types of pollution sources examined by NIPC include storm sewer and combined sewer outfalls, wastewater discharges, landfills, incinerators, hazardous waste disposal sites, and atmospheric deposition of pollutants. This information will be used to help determine the relative pollutant contributions from each source, and to formulate pollutant reduction and prevention strategies. ♦

# NIPC's Geographic Information System Assists in Watershed Studies

**N**IPC has applied geographic information system (GIS) technologies for three watershed studies which are summarized below. In these studies, geographic data such as soil types, land use, and hydrography have been assembled into a computer database. In addition to generating maps or statistics of individual geographic layers, a GIS allows the integration of multiple geographies for the analysis of complex problems.

## McCullom Lake

For a diagnostic/feasibility study of McCullom Lake in McHenry County, a GIS was used to map land use, soils, water and sediment depth contours, neighborhoods, aquatic plant communities

(see figure above), and hydrography. Also, the GIS integrated these data layers to provide detailed spatial analysis of McCullom Lake and its watershed. A spatial analysis not only defines the environmental problem, but determines where the problem is. In this manner, specific areas within McCullom Lake's watershed were shown to contain problem septic systems and/or contribute excessive amounts of nutrients to the lake.

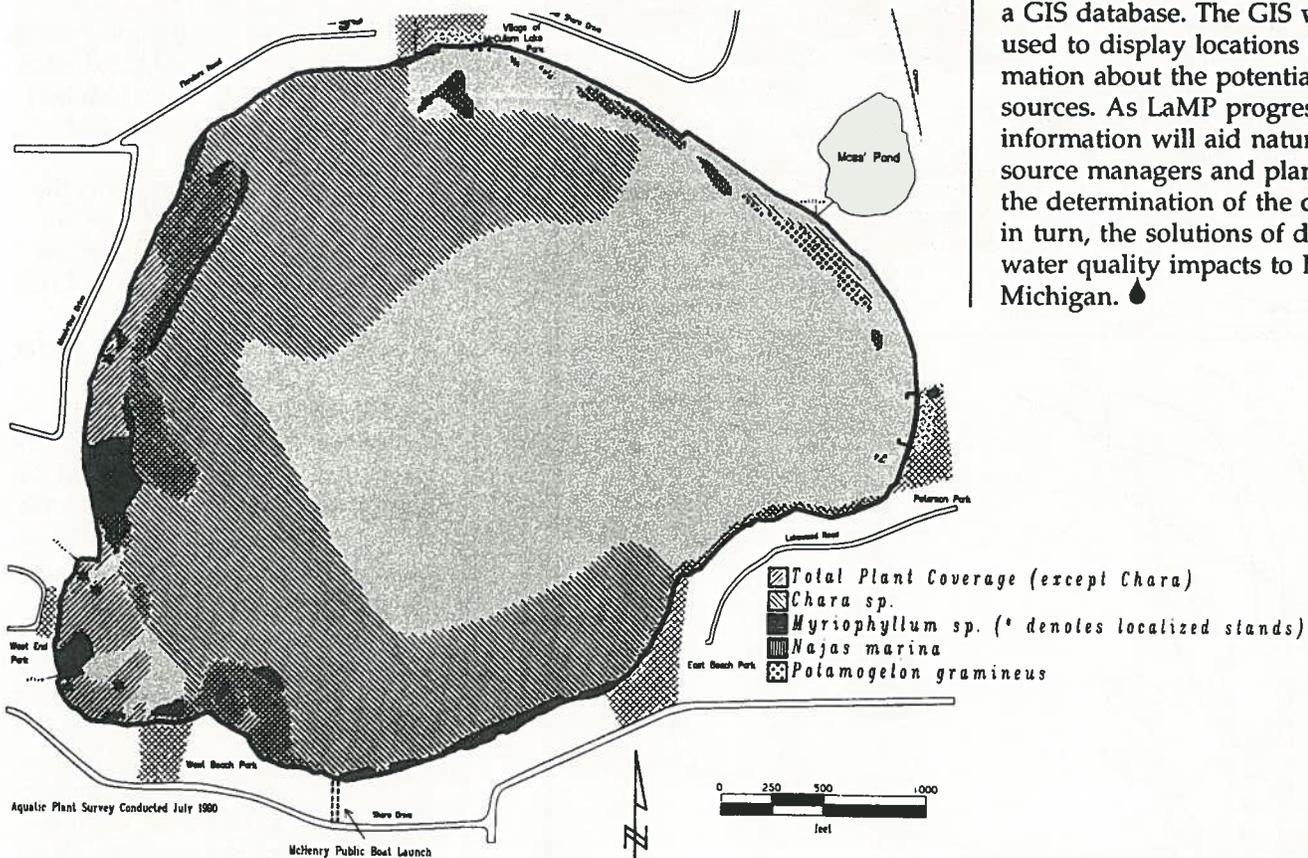
## Butterfield Creek

Numerous nonpoint source factors affecting stream use attainment were evaluated for the Butterfield Creek watershed in southern Cook and northern Will counties. The GIS was used to relate

land use, nonpoint source pollutant loadings, and degree of physical habitat alteration for stream reaches in three subwatershed portions of Butterfield Creek. As a result of this GIS analysis, NIPC was able to select and target BMPs for critical areas in the Butterfield Creek watershed.

## Lake Michigan

NIPC is also using the GIS to inventory potential sources of pollutants in the Illinois portion of the Lake Michigan watershed. This study is part of the Lakewide Management Plan (LaMP) (see article page 8). Locations of storm sewer outfalls, combined sewer outfalls, wastewater discharges, landfills and incinerators in the Lake Michigan watershed are being assembled into a GIS database. The GIS will be used to display locations and information about the potential pollution sources. As LaMP progresses, this information will aid natural resource managers and planners in the determination of the causes, and in turn, the solutions of deleterious water quality impacts to Lake Michigan. ♪



McCullom Lake 1990 Aquatic Plant Coverage  
McHenry County, Illinois  
Prepared by Northeastern Illinois Planning Commission

# 1991 Volunteer Lake Monitoring Program (VLMP)

**I**llinois' Volunteer Lake Monitoring Program (VLMP) continued with its 11th season during 1991. The IEPA initiated the VLMP in 1981 as a result of growing public interest in lakes and the need to expand the state's lake water quality data base. The purpose of the VLMP is to involve volunteers with lake monitoring, thereby providing effective public education in lake ecology and management as well as a useful data base for site-specific and state-wide lake quality assessment. NIPC

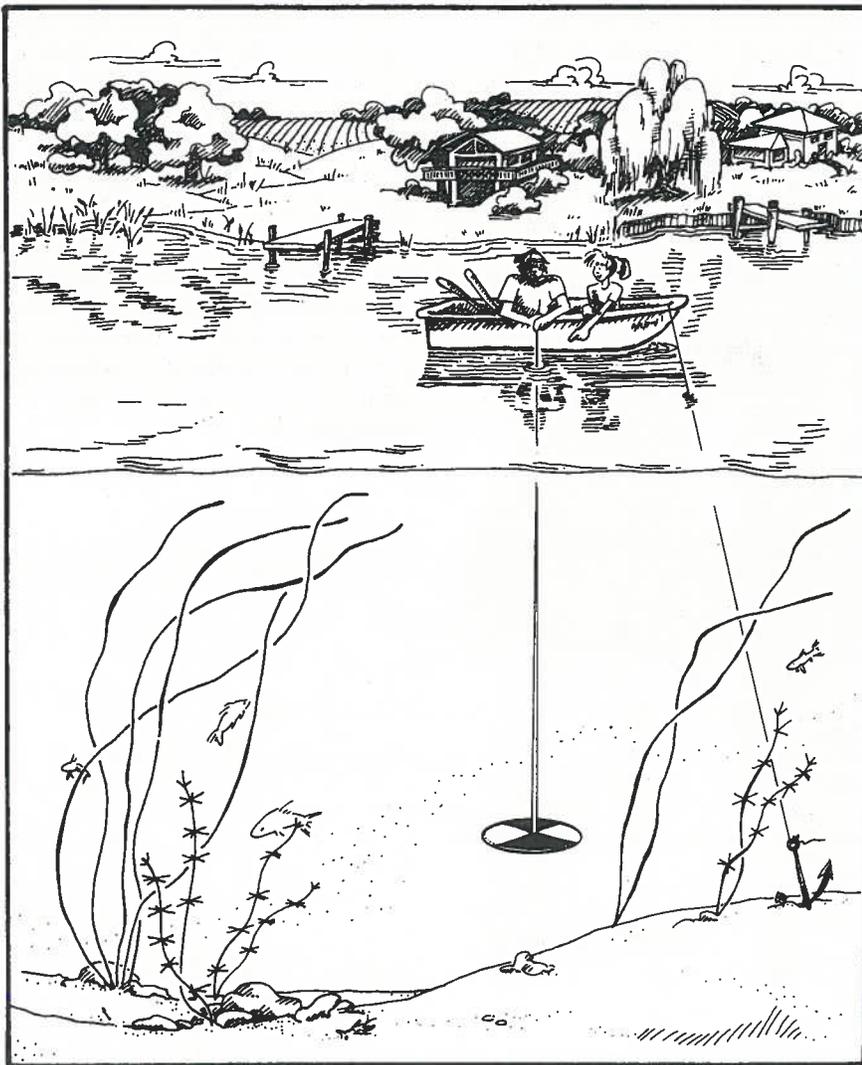
has served as program coordinator for the six-county northeastern Illinois region since 1983, providing volunteer training, educational materials, technical assistance, and an annual summary report.

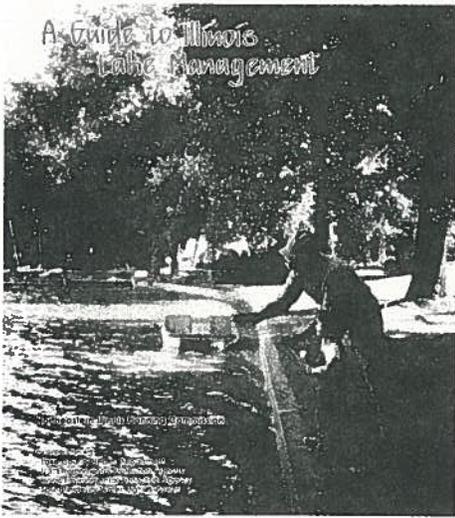
VLMP participants are trained to measure water clarity (transparency) with a Secchi disc: an eight-inch metal disc painted black and white in alternate quadrants, attached to a calibrated rope. The disc is lowered into the water and the depth to which it is visible is recorded. This measurement,

called the Secchi disc depth, is used to document changes in lake water clarity during the monitoring season, as well as from year to year. Typically, three sites are monitored in each lake twice per month from May through October. The volunteers also record a series of field observations including water color, suspended sediment and algae, aquatic plants, and weather conditions. Recent lake management activities or other factors which could impact the lake also are documented.

During 1991, 44 lakes in the region were monitored during four or more of the twelve semi-monthly sampling periods, with 57 volunteers participating. Additionally, at 11 lakes, volunteers performed additional water quality monitoring. Water samples were collected once per month (May through October) and analyzed for nutrients and suspended solids.

The figure below presents the 1991 lake ranking by average annual transparency. Wolf Lake, on the Illinois/Indiana border in Cook County, exhibited the greatest average clarity at 133 inches. Cedar Lake in Lake County followed closely with an average of 128 inches. The lowest annual clarity (7 inches) was at Meadow Lake in the Morton Arboretum (due to substantial algal growth). Out of 142 lakes statewide, Wolf Lake ranked fourth and Cedar Lake fifth. (Apple Canyon Lake in JoDaviess County in northwest Illinois exhibited the greatest annual clarity—156 inches). Fourteen of the top thirty lakes in the state (average clarity of at least 65 inches) were in the northeastern Illinois region. However, eight regional lakes were among the thirty lakes with lowest average transparencies (18 inches or less).





## A Guide to Illinois Lake Management Now Available

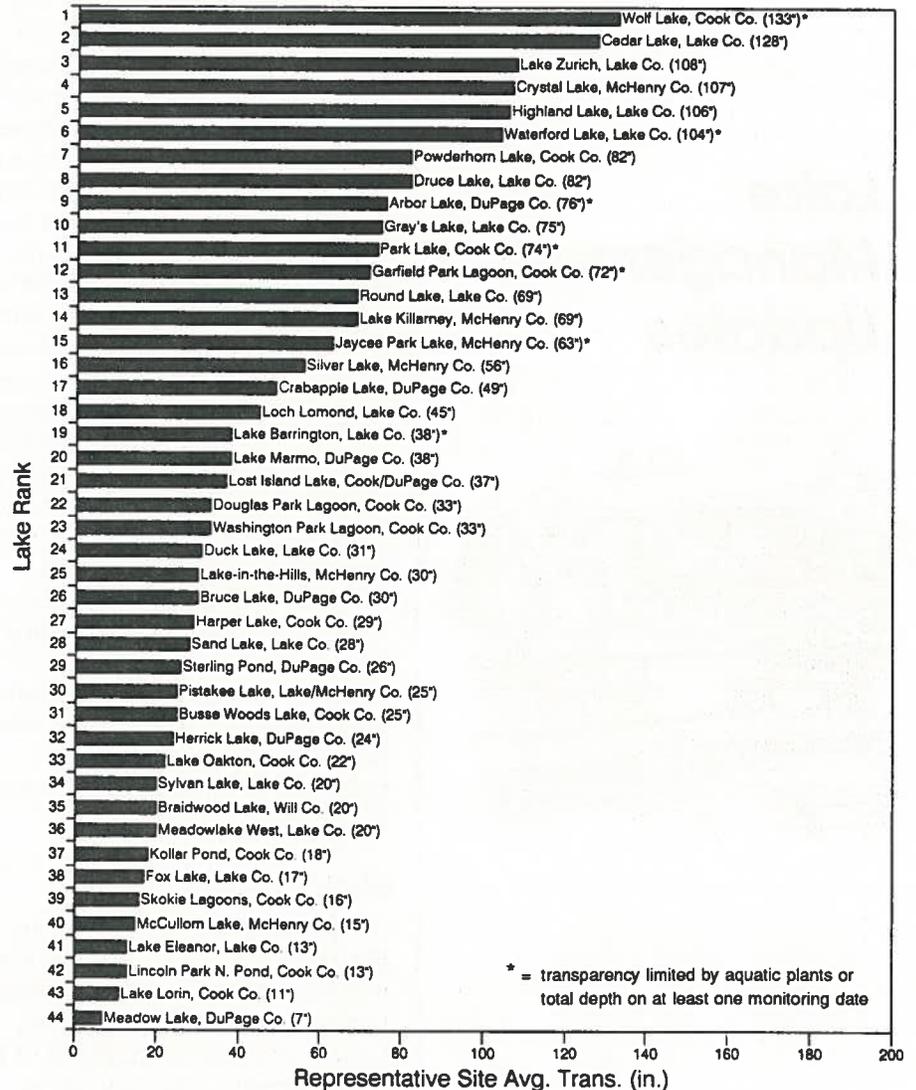
The Natural Resources Department has recently completed *A Guide to Illinois Lake Management*. Development of the guidebook was made possible with support from local, state, and federal sources. It provides a non-technical overview of the common problems and management challenges confronting many of our region's lakes. The intended audience for the guidebook includes local government decision-makers, local natural resource and recreation department staff, lake users and homeowners, and the general citizenry.

Thousands of lakes and ponds are scattered across the northeastern Illinois landscape, including nearly all of the state's natural glacial lakes. However, most of our lakes have experienced some degree of degradation and the threat for more problems is increasing. This publication attempts to underscore the vulnerability of lakes to human impacts, and the consequent need to actively manage our resources.

For information on how to obtain a copy of the guidebook, contact the Commission's Natural Resources Department.

## Northeastern Illinois Lake Rankings - 1991

(lakes monitored four or more sampling periods)

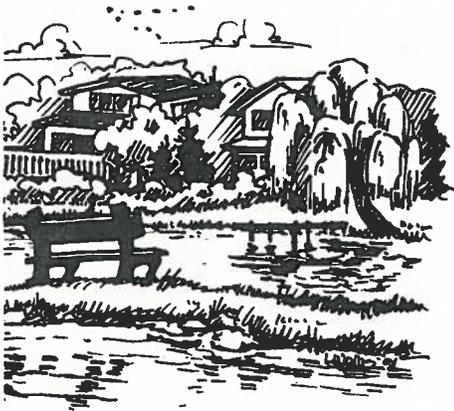


(VLMP continued from page 10)

The Illinois VLMP was recently recognized as the "Outstanding State Agency Volunteer Program" by Lt. Governor Bob Kustra. Statewide, 225 volunteers collect data on 150-175 lakes each year.

More information on the VLMP and copies of the 1991 VLMP regional report (as well as previous years' reports) are available from NIPC's Natural Resources Department.

## Lake Management Updates



### McCullom Lake

Nestled in the City of McHenry northwest of Chicago lies McCullom Lake, a 244-acre natural glacial lake. The City's interest in the lake became acute in 1984 when it acquired ownership for a majority of the lake's bottom. Although the lake was in relatively good condition, problems with turbid water and nuisance plant growth were evident. To investigate the causes of these problems and to identify possible solutions, NIPC and the City began a Phase I Diagnostic/Feasibility Study in 1989 under the U.S. EPA's Clean Lakes Program. This study, which was completed in Spring 1992, determined that among the primary causes of lake use impairments were nutrient loadings from poorly-functioning septic systems and sediment resuspension from bottom-feeding "rough" fish populations. Among the lake restoration/protection alternatives being considered are wintertime lake aeration to improve aquatic habitat, control of nuisance exotic species such as the Eurasian water milfoil plant and carp, and the reduction of septic system impacts to the lake.

### Skokie Lagoons

As reported in NIPC's previous Water Quality Reports, the seven interconnecting lakes of the Skokie Lagoons in northeastern Cook County are experiencing one of the most extensive lake restoration efforts in the country. Constructed by the Civilian Conservation Corps (CCC) in the 1930s for flood control and recreation, the Lagoons had fallen victim to pollution from an increasingly-urbanized watershed. A Clean Lakes Program Phase I study was conducted by NIPC in the early 1980s for the Lagoons' owner—the Forest Preserve District of Cook County (FPDCC). A twelve-part program was developed to restore and protect the Lagoons'

water quality, aquatic habitat, and recreational opportunities. Diversion of most inflowing pollutants from a wastewater treatment plant was accomplished in 1987. As part of a Phase II Clean Lakes Program grant to the FPDCC, over 1 million cubic yards of organic "muck" are being dredged from the lakes. The dredging is scheduled to be completed in late 1992. NIPC and the FPDCC currently are refining plans to restore and preserve aquatic and terrestrial habitat, and to further improve the Lagoons' environmental and recreational qualities.

### Sherman Park Lagoon

Rehabilitation of the Chicago Park District's Sherman Park Lagoon commenced in Spring 1992, thanks in part to a Phase II Clean Lakes Program grant from the U.S. EPA. Sediment removal and lake deepening already has begun. Afterwards, plantings of native aquatic species will be reestablished on the lakebed. The lake also will be restocked with fish as part of the Urban Fishing Program, a partnership between the Illinois Department of Conservation and the Chicago Park District. Lake restoration opportunities for Sherman Park Lagoon and three other Park District lagoons (Columbus, Humboldt, and Marquette) were identified in the late 1980s under the Phase I Clean Lakes Program study conducted by NIPC. Sherman Park Lagoon is the first lagoon in the park system to undergo such extensive restoration. It is hoped that the experience gained here will lead to similar restoration projects at the District's other park lagoons.

## Other Chicago Park District Lagoons

NIPC is currently conducting Phase I Diagnostic/Feasibility Studies at four additional Chicago Park District Lagoons: Douglas Park, Garfield Park, Lincoln Park North, and Washington Park. These investigations are scheduled for completion in late 1992.

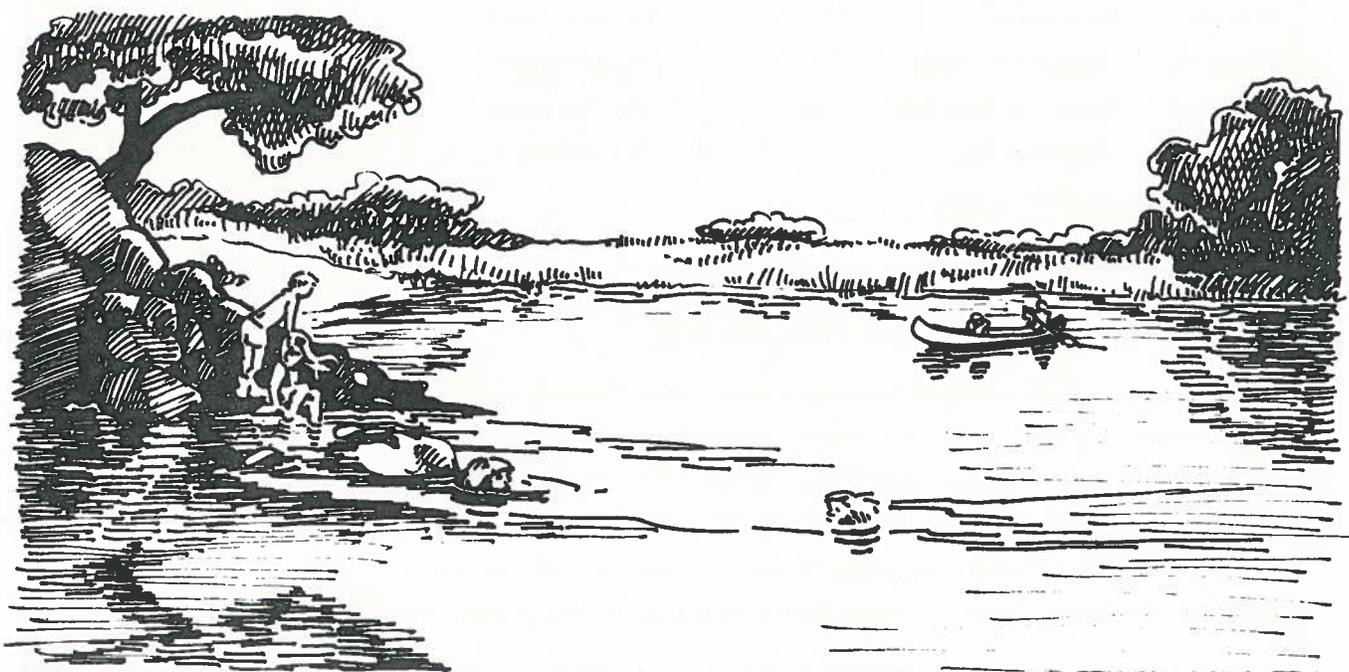
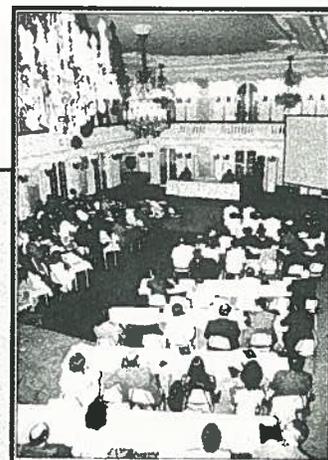
## Herrick Lake

One of the Forest Preserve District of DuPage County's most popular facilities is the Herrick Lake Forest Preserve near Warrenville. The 19.3-acre lake is a popular area for boating, fishing, wildlife observation, and shoreline picnicking. However, at times dense growth of aquatic vegetation, nuisance algae, and turbid water detract from the area's beauty and use. During the past year, NIPC has assisted the District in the completion of a Phase I Diagnostic/Feasibility study. Among the management alternatives being considered are shoreline stabilization, watershed nutrient controls, water level augmentation, and fisheries management. ♦

## Conferences and Workshops Increase the Region's Knowledge

During the past year, NIPC has coordinated a number of conferences and workshops aimed at greater understanding of natural resource issues. Among them were the *National Monitoring and Evaluation Conference & Nonpoint Source Workshop* (March 10-12, 1992), and the *National Conference on Enhancing the States' Lake Management Programs* (May 6-8, 1992). The Natural Resource Department's proven abilities in conference management have led to an increase in the number of conferences for which the Commission provides coordination assistance to federal and state agencies. Conferences and/or workshops

already planned for the coming year are: a conference on sediment contaminant issues in the North Branch of the Chicago River (October 1992), a course on designing urban stormwater best management practices (Fall 1992), a national conference on urban runoff management and control programs (Spring 1993), the annual meeting of the Illinois Lake Management Association (April 1993), and the *National Conference on Enhancing the States' Lake Management Programs* (May 1993). To receive more information about these and other educational offerings, contact the Commission's Natural Resources Department.



# WATER RESOURCES COMMITTEE REVIEW ACTIONS

JULY 1, 1991 TO JUNE 30, 1992

WQ	APPLICANT	REQUEST	FINDING
91-WQ-017	Village of Gilberts	New Discharge	Support
91-WQ-028	Village of Minooka	FPA* Amendment - Applicant Withdrew	N/A
91-WQ-035	Village of Fox River Grove	FPA Amendment	Support
91-WQ-036	Downers Grove S.D.	FPA Amendment	Support
91-WQ-047	Glenbard Wastewater Authority	FPA Amendment	Non-support
91-WQ-048	Village of Mundelein	FPA Amendment	Support
91-WQ-049	Village of Huntley	FPA Amendment	Support
91-WQ-077	Village of Algonquin	FPA Amendment	Support
91-WQ-080	Village of Channahon	New Discharge	Support
91-WQ-081	Village of Minooka	FPA Amendment - Applicant withdrew	N/A
91-WQ-082	Village of Wheeling	FPA Amendment	Support
91-WQ-093	Village of Carpentersville	FPA Amendment	Support
91-WQ-101	Metro Utility Company	New Discharge	Non-support
91-WQ-103	City of St. Charles	FPA Amendment	Support
91-WQ-104	Hubschman Construction Company	Land Treatment System	Support
91-WQ-112	City of St. Charles	FPA Amendment	Support
91-WQ-134	Sho-Deen, Inc.	Land Treatment System - Applicant withdrew	N/A
91-WQ-154	Fox River Water Reclamation District	Plant Expansion	Support
92-WQ-001	Village of Cary	Plant Expansion	Support
92-WQ-004	Village of Grayslake	FPA Amendment	Support
92-WQ-005	Village of Huntley	FPA Amendment	Partial support
92-WQ-009	Village of Orland Park	FPA Amendment	Non-support
92-WQ-014	DuPage Co. Dept. of Environmental Concerns	Plant Expansion	Support
92-WQ-015	City of Waukegan	FPA Amendment	Support
92-WQ-016	Village of Bolingbrook	FPA Amendment	Deferred
92-WQ-019	Thorn Creek Basin S.D.	FPA Amendment	Support
92-WQ-030	City of Crest Hill	FPA Amendment	Support

\* Wastewater Facility Planning Area

For further information on the topics discussed in this report, you may contact the following individuals through NIPC's Natural Resource Department at (312) 454-0400.

**Dennis Dreher**, Director of Natural Resources • Water Quality Protection and Wetland Management

**Robert Kirschner**, Principle Planner • Chain O'Lakes Fox River SAMP and Lake Management

**Thomas Price**, Senior Engineer • Stormwater Detention and Best Management Practices

**Holly Hudson**, Senior Planner • Volunteer Lake Monitoring Program

**Jay Clark**, Associate Planner • Geographic Information System (GIS) Applications

**Deborah Washington**, Director of Project Review • Wastewater Facility Planning Area Amendments



# northeastern illinois planning commission

400 West Madison Street Chicago, Illinois 60606

(312)454-0400

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**Patricia Sjurseth**, *Commissioner*

**Edgar Vanneman, Jr.**, *Commissioner*

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**Kathleen T. Meany**

### Appointed by the Board of the Illinois Association of Park Districts

**Ralph Cianchetti**, *President,*  
*Park District of Highland Park*

### Appointed by the Board of the Chicago Park District

**Margaret T. Burroughs**

*This annual water quality report was prepared in part using federal Water Pollution Control Act Section 205j funds from the Illinois Environmental Protection Agency and in part through voluntary contributions from the region's local governments and private sector.*

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# Water Quality Report 1991-92

Northwestern Illinois Planning Commission  
400 West Madison • Room 200  
Chicago, Illinois 60606 • 312/454-0400

